CONDITIONAL PETITION FOR EXTENSION OF TIME

If any extension of time for this response is required, applicant requests that this be considered a petition therefore. Please charge the required Petition fee to Deposit Account No. 03-1240.

ADDITIONAL FEE

Please charge any insufficiency of fees, or credit any excess to our Deposit Account No. 03-1240.

REMARKS

Reconsideration of the application, as amended, is respectfully requested. Claims 1-7, 9, 11 and 13-16 remain in this application.

In the Office Action dated September 5, 2001, the Examiner has rejected claims 5, 6 and 10 under 37 C.F.R. 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Claims 5 and 6 have been amended to further limit the subject matter while claim 10 has been cancelled in accordance with the Examiner's suggestion, thereby leaving the claims in allowable form. Further, claim 14 has been amended to correct the notation of r_1 in line 16 of the present claim.

It was also indicated by the Examiner that claims 8-10, 12 and 14 would be allowable if rewritten in independent form, including all of the limitations of the base claim and any intervening claims, and suitably amended

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to overcome the earlier objections to claim 10 and 14. (See Office Action of 9/05/01, para. 14.) Accordingly, dependent claim 9 and independent claim 14 are amended to clarify the nature of the claimed invention and claims 8, 10 and 12 are hereby cancelled without prejudice.

Applicant has amended claim 1, to include the following limitations:

1) when the radius of the central core is designated as r1 and the radius of the middle part is designated as r2, then $3.0 \leq r2/r1 \leq 5.0$;

2) when specific refractive index differences for the central core and the middle part are designated as $\Delta 1$ and $\Delta 2$ respectively where the refractive index of the cladding is taken as the standard, then $\Delta 1$ is at most 0.30% and $\Delta 2$ is -0.05 to -0.15%; and

3) the optical fiber has an effective core area of at least 120 μm2 in the employed wavelength band selected from the range of 1.53 to 1.63 μm, and has a cut-off wavelength that is capable of substantially single mode propagation in said employed wavelength band.

According to the amended claim 1, an optical fiber having a satisfactory effective core area, bending loss, cut-off wavelength, and increase in the sandpaper tension winding loss characteristics can be provided, which is not disclosed in any prior art. That is, References A

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(US Patent No. 5,781,684), B (US Patent No. 5,835,655) and C (US Patent No. 5,999,679) do not teach or disclose all of the limitations (1) to (3) Thus, the amended claim 1 is patentably distinct from the cited prior art.

Applicant has also amended claim 11 to include the following limitations:

4) the optical fiber has an effective core area of 120 µm2 or more in the employed wavelength band selected from the range of 1.53 to 1.63 µm, and has a cut-off wavelength that is capable of substantially single mode propagation in said employed wavelength band;

5) when the radius of the central core is designated as r1, the radius of the middle part is designated as r2, and the radius of the ring core is designated as r3, then $3.0 \leq r2/r1 \leq 4.0$ and $4.0 \leq r3/r1 \leq 5.0$; and

6) when the specific refractive index differences for the central core, the middle part, and the ring core are designated as $\Delta 1$, $\Delta 2$ and $\Delta 3$ respectively where the refractive index of the cladding is taken as the standard, then $\Delta 1$ is at most 0.35%, $\Delta 2$ is 0 to -0.2%, and $\Delta 3$ is +0.5 to +o.2%

According to the amended claim 11, an optical fiber having satisfactory effective core area, bending loss, cut-off wavelength, and increase in the sandpaper tension winding loss characteristics can be provided, which is not disclosed in any prior art. That is, none of the

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references A, B or C teach or disclose an optical fiber with all of the limitations (3) to (5). Thus the amended claim 11 is patentably distinct from the cited prior art.

Applicant further amended claim 14 by re-writing it as an independent claim. Since claim 14 has been objected to as being dependent upon a rejected base claim, claim 14 is now re-written and stands ready for allowance.

Attached hereto is a marked-up version, captioned **"Version With Markings To Show Changes Made"**, showing changes made to the claims by the current amendment. Applicant respectfully requests entry of the amendment and that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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CHADBOURNE & PARKE LLP

BY _____

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant	:	Kazuhiko Aikawa et al.
Serial No.	:	09/635,109
Filed	:	August 9, 2000
For	:	Optical Fiber and Optical Transmission System
Art Unit	:	2874
Examiner	:	Stahl, M.

December 3, 2001

Marked Version of Claims

Please cancel Claims 8, 10 and 12 without prejudice

1. (Amended) An optical fiber provided with a refractive index profile having a central core; a middle part provided around the outer periphery of said central core and having a lower refractive index than that of said central core; and a cladding provided around the periphery of said middle part and having a higher refractive index than said middle part and a lower refractive index than said central core;

wherein said optical fiber has an effective core area of 120 μm² or more in an employed wavelength band selected from the range of 1.53 [~] to 1.63 μm, and has a cut-off wavelength that is capable of substantially single mode propagation in said employed wavelength band, and

when the radius of the central core is designated as r_1 and the radius of the middle part is designated as r_2, then $3.0 \leq r_2/r_1 \leq 5.0$, and, when specific refractive index

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differences for the central core and the middle part are designated as Δ_1 and Δ_2 respectively where the refractive index of the cladding is taken as the standard, then Δ_1 is 0.30% or less and Δ_2 is -0.05 to -0.15%.

5. (Amended) An optical fiber according to claim 1, characterized in [effective core area is 120 μm^2 or more, and the] that the increase in the sandpaper tension winding loss is 10 dB/km or less.

6. (Amended) An optical fiber according to claim 1, characterized in [effective core area is 120μm^2 or more, and the] that the increase in the sandpaper tension winding loss is 1dB/km or less.

7. (Amended) An optical fiber according to claim 1, characterized in that the effective core area is 120 [~] to 150 μm², and the increase in the sandpaper tension winding loss is 0.3 dB/km or less.

8. CANCELLED.

9. (Amended) An optical fiber according to claim [8] 1, characterized in that Δ_1 is 0.26% or less.

10. CANCELLED.

11. (Amended) [An optical fiber according to claim 1, characterized in that] An optical fiber provided with a refractive index profile having a central core; a middle part provided around the outer periphery of said central core and having a lower refractive index than that of said central core; a cladding provided around the periphery of said middle part and having a higher refractive index than said middle part and a lower refractive index than said central core; and a ring core provided [in] between the middle part and the cladding [, said ring core] and having a higher refractive index than that of said middle part and said cladding [,] and a lower refractive index than that of the central

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core[.]:

wherein said optical fiber has an effective core area of 120 μm^2 or more in an employed wavelength band selected from the range of 1.53 to 1.63 μm, and has a cut-off wavelength that is capable of substantially single mode propagation in said employed wavelength band, and

when the radius of the central core is designated as r_1, the radius of the middle part is designated as r_2, and the radius of the ring core is designated as r_3, then $3.0 \leq r_2/r_1 \leq 4.0$ and $4.0 \leq r_3/r1 \leq 5.0$, and when the specific refractive index differences for the central core, the middle part, and the ring core are designated as Δ_1, Δ_2 and Δ_3 respectively where the refractive index of the cladding is taken as the standard, then Δ_1 is 0.35% or less, Δ_2 is 0 to 0.2% and Δ_3 is +0.05 to 0.2%.

12. CANCELLED.

13 (Amended) An optical transmission system characterized in that a dispersion compensating optical fiber is disposed to the side of the optical fiber according to claim 1 at which the optical signal is emitted, said dispersion compensating optical fiber compensating one or both of this optical fiber['s] wavelength [dispersing] dispersion value and [dispersing] dispersion slope.

14. (Amended) An optical transmission system [according to claim 13, characterized in that the] including a dispersion compensating optical fiber disposed to the side of an optical fiber at which the optical signal is emitted, wherein

the optical fiber is provided with a refractive index profile having a central core; a middle part provided around the outer periphery of said central core and having a lower refractive index than that of said central core; and a cladding provided around the periphery of said middle part and having a higher refractive index than said middle part and a lower refractive index than said central core; and the optical fiber has an effective core area of 120 μm^2 or more in an employed wavelength band selected from the range of

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1.53 to 1.63 μm, and has a cut-off wavelength that is capable of substantially single mode propagation in said employed wavelength band; and

said dispersion compensating optical fiber compensates one or both of the optical fiber wavelength dispersion value and dispersion slope, and is provided with a core and a cladding that is provided around the outer periphery of said core, said core consisting of a central core having a higher refractive index than said cladding, a middle part that is provided around the outer periphery of said central core and has a lower refractive index than said cladding, and a ring core that is provided around the outer periphery of said middle core part and has a higher refractive index than said cladding; [wherein:] in which

when the radius and the relative refractive index difference, with the cladding taken as the standard, for the central core, middle part, and ring core are designated as (r_1, Δ_1), (r_2, Δ_2) and (r_3, Δ_3), respectively, then r_1 is 2 [~] to 3 mm, Δ_1 is 0.9 [~] to 1.5%, Δ_2 is -0.35 to -0.45%, Δ_3 is 0.2 [~] to 1.2%, r_2/r_1 is 2.0 [~] to 3.5, and [r_3/r_4] r_3/r_1 is 3.0 [~] to 5.0;

a cut-off wavelength is provided that is capable of substantially single mode propagation, in which the effective core area is 20 μm^2 or more, the bending loss is 40 dB/m or less, and the wavelength dispersion is -65 [~] to -45 ps/nm/km, in an employed wavelength band selected from the range 1.53 μm [~] to 1.63 μm; and

the dispersion slope compensation ratio is in the range of 80 [~] to 120% when compensating said optical fiber with a length of the dispersion compensating optical fiber capable of compensating to zero the wavelength dispersion of the optical fiber to be compensated.

15. (Amended) An optical [fiber] transmission system according to claim 13, characterized in that the dispersion compensating optical fiber has an effective core are being 25 μm^2 or more.

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16. (Amended) An optical transmission system according to claim 13, wherein the average wavelength dispersion value when an optical fiber and a dispersion compensating optical fiber are combined is in the range of -6 [~] to +6 ps/nm/km.